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ABSTRACT

The purpose of this study was to investigate the effect of using optical-scan sheets on the response rate in a mail survey. No empirical data were available on this question, but casual observation had indicated that many researchers are concerned about possible negative effects of using optical-scan sheets. Questionnaires of two lengths and two answer formats were used. The total random sample of 200 public school teachers was randomly divided into four groups: short or long questionnaire with op-scan sheet for recording responses; short or long questionnaire with instructions to answer directly on the instrument itself. The results indicate that there were no significant differences in response rate for groups using the optical-scan sheets and those answering on the questionnaire or for the groups receiving questionnaires of different lengths. Furthermore, there was no significant interaction between length of questionnaire and answer format. It was concluded that researchers may have the convenience of optical-scan sheets without any negative effects on response rate. (Author)

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EFFECT OF THE USE OF OPTICAL-SCAN SHEETS ON SURVEY RESPONSE RATE

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Abstract

The purpose of this study was to investigate the effect of using optical-scan sheets on the response rate in a mail survey. No empirical data were available on this question, but casual observation had indicated that many researchers are concerned about possible negative effects of using optical-scan sheets. Questionnaires of two lengths and two answer formats were used. The total random sample of 200 public school teachers was randomly divided into four groups: short or long questionnaire with op-scan sheet for recording responses; short or long questionnaire with instructions to answer directly on the instrument itself. The results indicate that there were no significant differences in response rate for groups using the optical-scan sheets and those answering on the questionnaire or for the groups receiving questionnaires of different lengths. Furthermore, there was no significant interaction between length of questionnaire and answer format. It was concluded that researchers may have the convenience of optical-scan sheets without any negative effects on response rate.

Effect of the Use of Optical-Scan Sheets on Survey Response Rate
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EFFECT OF THE USE OF OPTICAL-SCAN SHEETS ON SURVEY RESPONSE RATE

The purpose of this study was to determine the effect of using optical-scan sheets on response rate in a mail survey. The study was designed after a review of the literature revealed a lack of research data on this question.

Numerous investigations over the past several years have looked at the relationship between questionnaire techniques and response rate in mail surveys. Techniques such as questionnaire follow-up, monetary incentives, feedback, type of mailing procedure, length, and personalization have been found to influence the rate of returns. Adams and Gale (1982) found a nonlinear relationship among the return ratio and questionnaires of three lengths. The shortest questionnaire was found not to be the most effective length for a high rate of return. When no follow-ups or incentive procedures were used, a three-page questionnaire had greater returns than a one- or five-page questionnaire; the one-page, however, had a return rate nearly two times that of the five-page questionnaire. They concluded that the nonlinear characteristics in rate of returns for different lengths are confounded with interaction effects from other variables such as follow-up procedures, incentives, etc., in previous studies. Powers and Alderman (1982) reported that offering feedback had a significant positive effect on response rate, but the magnitude of that effect was slightly less than the increase resulting from a shorter questionnaire and much less than a follow-up contact with nonrespondents. Hopkins and Podolak (1982) observed that the class-of-mail used (1st class vs. 3rd class) had no significant effect on return rate of a mailed questionnaire. Return rates were increased, however, when a one dollar gratuity was included in the first class mailing. Zusman and Duby (1984) also demonstrated a substantial improvement in response rate when a monetary incentive was used. A single mailing with an incentive was found to be much more effective in eliciting responses than two mailings to an identical group not receiving the incentive.

Rucker, Hughes, et al., (1984) were interested in the effect of personalizing a questionnaire through the inclusion of a picture of the researcher in the cover letter. Initial and total returns were lower in the researcher-pictured cover letter conditions. They concluded that repeated use of personalized mailings may have a negative effect on response rate. Cookingham (1985) investigated the effect of using preprinted computer labels on return rate. He concluded that letter-quality computer printers can be used to prepare address labels for surveys without significantly reducing rates.

While the effect of several techniques on response rate has been well documented, a review of the literature revealed no research dealing directly with the effect of using machine-scannable (optical-scan) answer sheets. The purpose of this investigation was therefore to determine the effect of using the machine-scannable sheets on response rate in a mail survey.

Researchers who are planning a survey frequently ask whether to use the separate scannable answer sheets or whether to have respondents answer directly on the questionnaires. Many researchers seem reluctant to use the scannable sheets because they believe that people, especially adults, object to them. One educator was overheard to say, "Whenever I receive a questionnaire with one of those 'bubble' sheets, I throw it away. I refuse to use them." How widespread this attitude is is not known, hence the need for data on the question.

Researchers must balance the cost of the sheets and the optical scanning against the time and effort involved in later transferring the data from the questionnaires to scannable coding sheets or directly into a computer terminal. The separate answer sheets permit large amounts of data to be handled quickly with the elimination of the problem of coding errors. In spite of the advantages, researchers would not want to use the scannable sheets if there were any possible negative effects on return rate. While this study lacks a theoretical foundation, it can provide information that would be beneficial to researchers who must judge the merits of using the scannable answer sheets.

Method

A total of 200 questionnaires was mailed to a random sample of public school teachers in Indiana. The questionnaire dealt with attitudes and opinions concerning discipline in the public schools. Although the survey data per se were not relevant to the study, the topic of discipline was chosen for the survey because it is one in which teachers have an interest and about which they are typically eager to express opinions.

Half of the questionnaires included a separate machine-scannable sheet. Respondents were directed to record all responses on the sheet. The other half had directions to record responses directly on the questionnaire itself. Questionnaires of two lengths were used in order to determine if the length of the instrument affected whether respondents would use the optical-scan sheet. Perhaps respondents would be more likely to see the need for a machine-scannable sheet and thus be more willing to use it if the questionnaire were long rather than short. Thus the total sample was randomly divided into four groups of 50 each. One group received the short questionnaire with an optical-scan form; another received the short questionnaire with instructions to respond directly on the questionnaire. A third group received the long questionnaire with the optical-scan form; the fourth group received the long questionnaire and recorded answers directly on the questionnaire.

The short questionnaire consisted of only one page containing 14 items. The long questionnaire was two pages in length; it contained the same 14 items plus an additional six items.

A cover letter containing a fabricated purpose for the survey, an appeal for cooperation, and a promise of confidentiality accompanied the questionnaire. The questionnaires were mailed first-class in envelopes with the university bureau's name and address; computer mailing-address labels were used on the envelopes. A stamped, pre-addressed return envelope was included for the respondents' use. Two weeks following the initial mailing, a postcard reminder was mailed.

The research hypotheses for this study were: 1) the response rate for the individuals who are to answer directly on the instrument will be significantly greater than the response rate for those directed to use the optical-scan sheet and 2) the response rate will be significantly greater for the optical-scan group when the questionnaire is long rather than short.

Results

Table 1 shows the percent of returned questionnaires for each group both before and after the postcard reminders.

See Table 1 (attached)

One hundred forty-six or 73 percent of the questionnaires were returned after the initial mailing. The postcard reminder brought an additional 14 questionnaires making the final response rate for the survey 80 percent. The final response rate for the group using the optical-scan sheets regardless of length was 81 percent; the response rate for those answering directly on the questionnaire was 79 percent.

In order to determine if there was a relationship between the length of the questionnaire and response rate with the two response formats, a chi square analysis was done. Table 2 shows the total number of questionnaires returned.

See Table 2 (attached)

Table 2 shows that none of the effects was significant. The number of returns from respondents using the optical-scan sheets (N=81) and those answering on the questionnaires (N=79) was almost the same. The returns for long (N=79) and short (N=81) questionnaires were almost identical. The next question was whether there was an interaction between answer format and length. Table 2 shows that a slightly greater number of long questionnaires were returned when machine-scannable sheets were used, whereas slightly more short questionnaires were returned when answers were recorded directly on the questionnaire. A chi-square, however, revealed that the relation was not significant ($\chi^2 = .399$, $P > .05$).

Conclusion

The research hypotheses were not supported. It can be concluded that the use of machine-scannable sheets does not adversely affect return rate in a mailed questionnaire. Researchers should not hesitate to use the optical-scan sheets. This is true regardless of the length of the questionnaire.

This research has the limitation of low numbers in each group. Since the study was not conducted for the purpose of gathering data per se, the expense of large numbers could not be justified. It is recommended that the study be replicated in a research situation where large numbers can be used. Furthermore, it is recommended that the two lengths of the questionnaire be more clearly distinguished in any future replications of the study. It is possible that the lengths were not sufficiently different for any noticeable effect of length on preference for using the optical-scan sheet to manifest itself.

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Table 1. Percents of questionnaires returned initially and after postcard reminder by respondents with two answer formats and two lengths.

Length of Questionnaire	Group	
	OPTICAL-SCAN SHEETS	
	Initial	With Reminder
Short	62	78
Long	82	84
	NO OPTICAL-SCAN SHEETS	
	Initial	With Reminder
Short	80	84
Long	68	74

Table 2. Chi-Square analysis of total responses by length and answer format.

Length of Questionnaire	Group		Total
	OP-SCAN SHEETS	NO OP-SCAN SHEETS	
Short	39	42	81
Long	42	37	79
Total	81	79	160

$\chi^2 = .399$